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PRELIMINARY GEOLOGY AND LITHOGEOCHEMISTRY OF SELECTED ROCK SAMPLES, RILEY BROOK MAP AREA, EAST HALF (NTS 21 O/3E), VICTORIA COUNTY, NEW BRUNSWICK

by
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ILLUSTRATIONS

Figure 1. Location of the Riley Brook (east) (21 O/3E) map area, Victoria County, New Brunswick 2

Plate 88-43 Preliminary geological map and lithogeochemical sample locations, Riley Brook (East) ..... in pocket

PRELIMINARY GEOLOGY AND LITHOGEOCHEMISTRY OF SELECTED ROCK SAMPLES, RILEY BROOK MAP AREA, EAST HALF (NTS 21 O/3E), VICTORIA COUNTY, NEW BRUNSWICK

INTRODUCTION

During the summer of 1988, detailed geological mapping was undertaken on the eastern half of the Riley Brook map area (21 O/3E) (Figure 1), which is underlain by a sequence of interbedded and interfingering sedimentary and felsic to mafic volcanic rocks comprising the Lower Devonian Tobique Group. The Riley Brook map area is situated southwest of the Jacquet River - Upsalquitch belt of Lower Devonian (Dalhousie Group) volcanic and sedimentary rocks, which are known to be locally auriferous.

The objective of this project was to generate an improved geological data base in order to encourage mineral exploration, and to evaluate the metallic mineral potential of the area. In addition, the resulting geological map (Plate 88-43 in the back pocket), although preliminary, provides an enhanced geological base for the interpretation of regional till geochemical, silt geochemical, and airborne radiometric surveys conducted in the Riley Brook area this year.

As mapping proceeded, grab samples of altered, silicified, or mineralized rocks were collected wherever they were encountered. A total of 78 samples from 63 outcrops have been analysed for a suite of 20 elements.

Although no mineral occurrences of economic grade were found, several of the analysed samples contain highly anomalous amounts of gold and several of the pathfinder trace elements characteristic of epithermal precious metal deposits (e.g., As, Sb, Hg, and Tl). Most of these anomalous samples are altered or silicified felsic volcanic rocks, although those in the northwest portion of the map area near Riley Brook are mainly altered siltstones and basalts containing abundant hematite-filled cross-cutting fractures.

GENERAL GEOLOGY

The Riley Brook (east) map area is underlain by interbedded and interfingering sedimentary and mafic to felsic volcanic rocks belonging to the Lower Devonian Tobique Group (Plate 88-43).

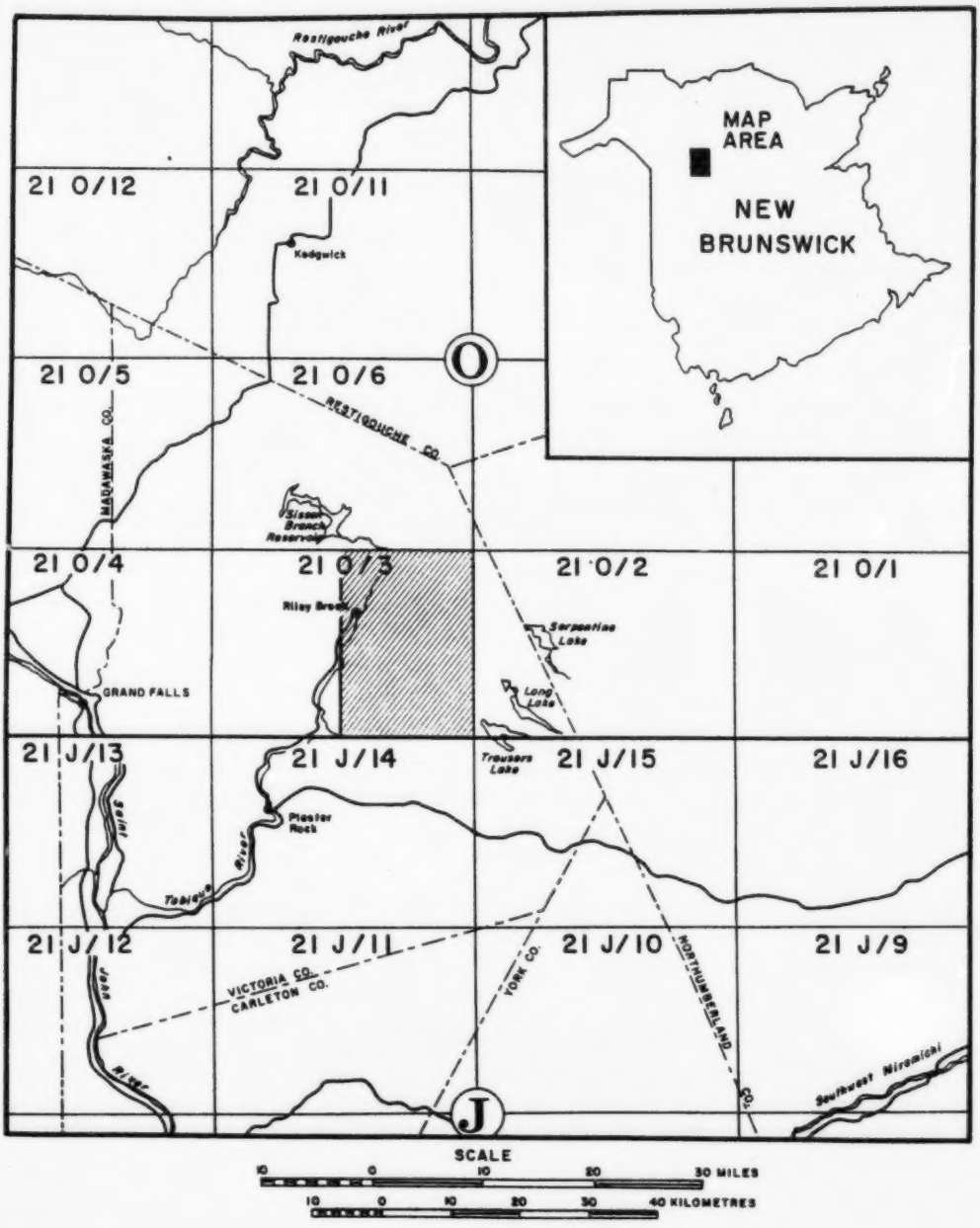

Figure 1. Location of the Riley Brook (east) (21 O/3E) map area, Victoria County, New Brunswick.

The subdivision of the Tobique Group into the Costigan Mountain Formation and Wapske Formation, as defined by St. Peter (1978) in the Wapske-Odell region farther south, is inapplicable in the Riley Brook area as those units comprising the Costigan Mountain Formation type section pinch out and are replaced by interfingering assemblages of felsic and mafic volcanic and sedimentary rocks. Although these lithologies often form broad and extensive map units, locally the stratigraphy is too complex to convey at a regional scale of mapping.

Sedimentary rocks comprise areally extensive mappable units, and are commonly present as thin interbeds within mafic or felsic rock units, facilitating the interpretation of the structure in these areas. Bedding attitudes in sedimentary rocks indicate a number of folds, although the role of folding in accounting for the observed distribution of the various map units (i.e., structural repetition of beds) is unclear as yet.

There is a substantial variation among the various volcanic map units, both in terms of their lithology and in their stratigraphic thickness and linear extent. Felsic volcanic units are typically lenticular in shape and pinch out along strike; massive and aphanitic to sparsely porphyritic rhyolites constitute the greater proportion of these units, which appear to be rhyolite domes. Felsic pyroclastic rocks, mainly ash flows and ash-and-lapilli tuffs, can be mapped as more elongate units. It is possible that the rapid pinching out of some of the felsic units coincides with fold closures. Haystack Mountain and Bald Peak are very resistant, inverted-cone-shaped prominences consisting of fine-grained porphyritic felsic to intermediate intrusive rock. They probably represent subvolcanic feeder pipes for some of the felsic volcanic units. Local exposures of feldspar porphyry are also believed to be shallow plutonic equivalents of some felsic extrusive rocks.

The presence of local orthoclase-hornblende syenitic intrusive rocks implies that some of the extrusive rocks may be alkali varieties (e.g., trachytes). Airborne magnetic highs over some felsic volcanic units support this hypothesis, as these alkaline rocks are typically high in iron; chemical analyses and petrographic examinations will establish whether this is the case.

Two generations of mafic intrusive rocks are present: one suite appears to be contemporaneous with volcanic activity and therefore represents feeders for the mafic extrusive rocks, whereas a later suite includes post-Acadian dykes and small stocks. Whole-rock chemical analysis will be employed to help confirm this interpretation.

Faulting has played some role in locally offsetting or terminating rock units: a number of east-southeast-trending faults have been defined by lithological and aeromagnetic discontinuities and topographic linears.

MAJOR GEOCHEMICALLY ANOMALOUS AREAS

Four areas show distinctive trace-element signatures and enrichments that may represent alteration haloes associated with unexposed precious-metal deposits. These are designated as the Shingle Gulch, Sewell Brook, Riley Lake, and Riley Brook areas. Descriptions of all analysed samples are provided in Appendix 1. Methods and detection limits are listed in Appendix 2, and the lithogeochemical data are presented in Appendix 3.

Shingle Gulch

Samples RB-16A, -16B, -17A, -17B, -18, -19A, and -19B were collected from trenches excavated by Canadian Occidental Petroleum Limited during a base-metal exploration programme in 1980-81 (Burns 1982). Several companies (Amoco Canada Petroleum Limited 1976; Bjornson 1975b, 1976; Blecha 1968b, 1969; Crossley 1970; Dimmell 1986; Downie 1970; Hoy 1985; LaRocque 1957; Maingot 1976; and McKenzie 1986) have investigated the Shingle Gulch area over the last three decades, mainly in an attempt to locate the source of highly anomalous base-metal values in silts from Shingle Gulch, Little Everett Brook, and other small streams flowing into River Dee southeast of Shingle Gulch.

Samples RB-16A and -16B were taken from a trench about 1 km west of Shingle Gulch, whereas the others are from trenches roughly 1.5 km southeast of Shingle Gulch, halfway to Four Mile Brook. Most of these samples are characterized by marked potassium enrichment and/or sodium depletion. The highest of the anomalous values for various elements are as follows:

Sample	Anomalous Values
RB-19A	120 ppb Au, 66 ppm Sb, 310 ppm Cu, 3600 ppm Zn
RB-19B	410 ppm As, greater than 1000 ppb Hg, 23.5 ppm Tl, 5340 ppm Ba
RB-17B	12 ppm Sn, 12 ppm W
RB-16B	3000 ppm Pb, 16 ppm Cd (the latter is one of the few cases where Cd exceeds the detection limit)

The zone of intense alteration, which yielded the highly anomalous values at RB-19, appears to be continuous between RB-19 and RB-17, based on the lithological descriptions in the

Canadian Occidental Petroleum Limited assessment report (Burns 1982). Rocks mapped in other trenches nearby are often 'intensely kaolinized' (referring to the bleached felsic volcanic rocks found here), highly fractured, pyritiferous, or moderately to abundantly stained with hematite. The latter feature seems to be characteristic of epithermal systems in the Riley Brook map area.

Mineralized and altered rhyolite also occurs northeast of the trench sites, on the opposite side of River Dee. Samples RB-14 and -15 are located along strike of the mineralized and altered rocks at RB-17 and RB-19, assuming some right-lateral offset on a fault in the valley of River Dee; RB-14 yielded values of 8 ppb Au, 110 ppm As, 140 ppb Hg, 270 ppm Cu, and 1900 ppm Zn.

Sewell Brook

Samples RB-1A, -1B, -2, -3, -4, -5, -24A to -24C, -29, -34, and -35 were collected in the Sewell Brook-Stewart Brook area, where base-metal exploration was previously carried out by R.J. Wright (Blecha 1968a), Amoco Canada Petroleum Company Limited (Bjornson 1975a), and McIntyre Porcupine Mines Limited (Nixon 1957). The best showing is at RB-24, just north of Sewell Brook, where very high values in several elements were obtained: 170 ppb Au, 1400 ppm As, 32 ppm Ag, 310 ppm Sb, 1510 ppm Ba, more than 1000 ppb Hg, 40 ppm W, 85 ppm Tl, 7400 ppm Pb, and 5100 ppm Zn. The showing is hosted by an apparent felsic dyke that has intruded and silicified gray slaty siltstone. Brecciated and leached zones are localized along the margins of the dyke. Sulphides include pyrite (locally 10-15%) and minor galena.

Samples RB-1A and -1B were collected from a sheared mafic dyke intruding siltstones along the Stewart Brook road northwest of sample location RB-24. The margins of the 30 m wide dyke are altered, limonitic, and pyritiferous; later minor faulting within and along the margins of the dyke have presumably caused the shearing. Sample RB-1B contains 350 ppm As, 30 ppm Sb, and 780 ppb Hg.

In two roadside outcrops north of RB-1, including the outcrop where RB-5 was taken, there is evidence of explosive hydrothermal activity. Coarsely fragmented monomictic breccia at these locations is interpreted to represent a portion of a (phreatic) breccia pipe, as the fragments are haloed by wide white alteration rims apparently caused by reaction with volatiles.

Riley Lake

Samples RB-52, -53A, -53B, -58, -59, -60, and -61 were collected in the Riley Lake area, where anomalous gold values in stream silts have led to the staking of claims around Riley Lake and Reed and Hutchinson Pond. The highest values were obtained from a dark gray, very hard and massive, silicified (often cherty-looking) rhyolite, locally containing up to 25% pyrite and minor galena. Silicified gray siltstone was noted in float and is probably interbedded with the rhyolite. In sample RB-53, highly anomalous values were obtained for Au (40 ppb), As (2300 ppm), Sb (63 ppm), Hg (380 ppb), Tl (37 ppm), and Mo (16 ppm).

Local silicification, pyrite disseminations, and bleached, limonite-stained zones were also observed in rhyolite southwest of Riley Lake (RB-58, -59, -60). Although the only significant anomalous values obtained were for Hg in RB-59 (260 ppb) and Mo in RB-60 (18 ppm), the very high K/Na ratios in all three samples show that these rocks have also undergone some alteration.

Two holes were drilled on the north side of Riley Lake in 1980 by Matagami (Huska 1980) but no mineralization of significance was encountered.

Riley Brook

Samples RB-42 to RB-51 were collected along or near Riley Brook, in an area underlain by interbedded and open-folded dark green basalt and gray to brown siltstone. Most of these samples exhibit styles of alteration characteristic of epithermal systems; in particular, leached, fractured, and hematite-veined siltstones at RB-44, -47, -48, and -50 are identical with those seen at the Rocky Brook occurrence in the Jacquet River belt of northern New Brunswick. Mafic volcanic rocks at RB-49 and -50 are similarly intensely leached and hematized, whereas a coarse-grained, pale green felsic tuff at RB-51 has also undergone considerable alteration. These strongly altered rocks are typically localized at or near the contacts between siltstone and basalt units. Unfortunately, most of the values obtained from these samples are surprisingly low; the best results were obtained from:

Sample	Anomalous Values
RB-47B	300 ppm As, 61 ppm Sb
RB-51A	85 ppm As, 34 ppm Sb
RB-43B	10 ppb Au
RB-45	44 ppb Hg

However, these rocks may have been only peripherally affected by hydrothermal activity; the widespread occurrence of epithermal-style alteration in the Riley Brook area should be considered a positive indication of the potential for precious-metal mineralization.

Samples RB-40, -41A, and 41B, located on the Riley Brook road just west of Bald Peak, are quite different and consist of pyrite-rich, brecciated horizons of felsic material (fine-grained dykes?) hosted by dark gray to green basalt. Sample RB-40 carried high values in Au (38 ppb), Cu (180 ppm), and Zn (670 ppm), whereas RB-41 (A or B) contain the most anomalous values of Ag (5.5 ppm), As (440 ppm), Sb (23 ppm), Hg (270 ppb), Pb (770 ppm), and Mo (12 ppm)

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Appendix 1. Sample Descriptions

Appendix 1. Sample Descriptions

RB-1A: Altered, limonitic, pyrite-bearing sheared mafic dyke

RB-1B: Altered, limonitic, pyrite-bearing sheared mafic dyke

RB-2: Pale green to yellowish rhyolite; abundant iron oxidation on fracture surfaces

RB-3: Pale grey to green rhyolite with disseminated pyrite and abundant iron oxidation on exposed surfaces

RB-4: Pale beige to yellow-green, possibly bleached rhyolite; oxidized on all exposed surfaces

RB-5: Pale grey rhyolite containing disseminated pyrite

RB-6A: Pale grey, possibly bleached rhyolite; oxidized on all exposed surfaces

RB-6B: Pale grey, possibly bleached rhyolite; oxidized on all exposed surfaces

RB-7: Pink-purple rhyolite with minor pyrite and numerous hematitic cross-cutting veinlets

RB-8: Pyrite-rich pink rhyolite near contact with mafic dyke

RB-9: Pale green to white brecciated rhyolite; minor quartz veining

RB-10: Felsic lapilli tuff

RB-11: Grey, locally 'cherty' rhyolite; minor quartz veining

RB-12: Grey porphyritic rhyolite containing disseminated pyrite; oxidized on weathered or fracture surfaces

RB-13: Dark grey rhyolite, minor pyrite

RB-14: Grey porphyritic rhyolite containing pyrite, galena, and sphalerite; oxidized on fracture surfaces

RB-15: Rhyolite containing minor pyrite, galena; interbedded with sediments and pyroclastics

*RB-16A: Fractured, bleached beige-white rhyolite(?) with limonite or iron-carbonate alteration

*RB-16B: Dark grey, massive dacitic volcanic containing pyrite and galena

*RB-17A: Very fractured and bleached rhyolite(?); limonite or iron carbonate alteration along abundant cross-cutting microveinlets

*RB-17B: Dark grey, brecciated limonitic rhyodacite(?), locally pyrite-rich, with many cavities

*RB-18: Andesitic volcanic rock, locally pyrite-rich and containing cavities rimmed with galena; minor sphalerite

*RB-19A: Dark grey silicified felsic volcanic rock; local abundant pyrite, some galena

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*Sample from CanOxy trenches in Shingle Gulch area

*RB-19B: Very bleached and fractured rhyolite(?); possibly alteration of RB-19A; abundant cross-cutting microveinlets with hematite or iron-carbonate alteration; possible barite

RB-20: Pale green, possibly silicified rhyolite

RB-21: Quartz vein in flow-banded grey rhyolite

RB-22: Pink-orange fractured rhyolite containing quartz and hematite veins

RB-23: Grey massive rhyolite with pyrite fracture-fillings and disseminations

RB-24A: Silicified and brecciated felsic rock, probably a small dyke

RB-24B: Bluish-grey, brecciated and highly silicified felsic dyke; contains pyrite, galena

RB-24C: Strongly silicified siltstone

RB-25: Hematite-rich, carbonate-veined basalt

RB-26: Grey-green rhyolite, altered to beige in colour and containing cross-cutting hematitic veins mantled by hematite alteration

RB-27: Light green altered mafic volcanic rock

RB-28: Pale green altered siltstone with hematite and manganese staining on fracture surfaces

RB-29: Silicified siltstone containing vuggy quartz vein

RB-30: Maroon rhyolite containing hematitic quartz veins

RB-31: Pale green rhyolite containing quartz-hematite veins

RB-32: Pale green silicified siltstone, interbedded with basalt

RB-33A: Pale bleached rhyolite; some quartz veining, trace of pyrite

RB-33B: Pale bleached rhyolite; some quartz veining, trace of pyrite

RB-34: Grey-green to pink rhyolite flow breccia

RB-35: Brecciated, silicified, quartz-veined flow-banded rhyolite

RB-36: Brown flow-banded rhyolite; minor pyrite

RB-37: Gabbro, very friable and oxidized; may be iron-carbonate alteration

RB-38: Pink-brown siltstone, result of iron alteration of grey quartzose siltstone

RB-39: Very friable and weathered or altered gabbro

RB-40: Green felsic to intermediate pyrite-rich volcanic rock, interbedded with basalt

RB-41A: Green pyrite-rich brecciated rock containing vuggy quartz veins; apparently near contact between mafic and felsic flows

RB-41B: Green pyrite-rich brecciated rock containing vuggy quartz veins; apparently near contact between mafic and felsic flows

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*Sample from CanOxy trenches in Shingle Gulch area

RB-42: Grey to white altered siltstone containing numerous hematite-filled cross-cutting fractures

RB-43A: Basalt containing abundant hematitic chert or jasper

RB-43B: Green chert

RB-44: Highly altered, silicified, hematized mafic volcanic(?) rock

RB-45: Grey-brown siltstone

RB-46: Grey-white sandstone, possibly has undergone some iron alteration

RB-47A: Brecciated, bleached, locally silicified siltstone with abundant cross-cutting hematite veins

RB-47B: Brecciated, bleached, locally silicified siltstone with abundant cross-cutting hematite veins

RB-48: Altered, bleached siltstone with cross-cutting hematitic veinlets

RB-49A: Extremely bleached, fractured, and locally sheared rock with iron oxidation on fracture surfaces; protolith unknown

RB-49B: Pale grey silicified siltstone

RB-50A: Altered, bleached siltstone with cross-cutting hematitic fractures and veinlets

RB-50B: Leached, silicified, and hematized basalt

RB-51A: Very altered, bleached, brecciated, hematite-veined, fine-grained, felsic volcanic

RB-51B: Pale green, altered and bleached lapilli tuff

RB-52: Altered, silicified, brecciated grey-green siltstone; minor pyrite

RB-53A: Silicified, brecciated, pyrite-rich dark grey rhyolite; minor galena

RB-53B: Silicified, brecciated, pyrite-rich dark grey rhyolite; minor galena

RB-54: Grey, limonite-stained and quartz-veined flow-banded rhyolite

RB-55: Pink-buff massive rhyolite with minor pyrite

RB-56: Apparently silicified rhyolite, contains disseminated pyrite

**RB-57: Pink-buff, limonite-stained rhyolite; local disseminated pyrite

RB-58: Green, massive, aphanitic rhyolite; contains disseminated pyrite

RB-59: Flinty or cherty (silicified) massive grey aphanitic rhyolite

RB-60: Pink to white massive, aphanitic, limonite-stained rhyolite; contains disseminated pyrite, minor galena, possible sphalerite

RB-61: Grey, cherty (silicified?) flow-banded rhyolite, rusty on weathered surface, mineralized with pyrite and minor galena

RB-62: Bleached, fractured, and silicified pink massive rhyolite

RB-63: Bleached pink to cream coloured rhyolite with numerous cavities and considerable hematite alteration

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**Sample from Matagami trench, northwest of Black Mountains

Appendix 2.

Analytical Methods and Detection Limits

Appendix 2. Analytical Methods and Detection Limits

ELEMENT	METHOD	DETECTION LIMIT
Au (gold)	FADCP	1.0 ppb
Ag (silver)	DCP	0.5 ppm
As (arsenic)	NA	1.0 ppm
Sb (antimony)	NA	0.2 ppm
Hg (mercury)	wet	5.0 ppb
Bi (bismuth)	ICPMS	0.1 ppm
Tl (thallium)	ICPMS	0.1 ppm
Ba (barium)	ICPMS	1.0 ppm
Cu (copper)	DCP	0.5 ppm
Pb (lead)	DCP	2.0 ppm
Zn (zinc)	DCP	0.5 ppm
Mo (molybdenum)	DCP	1.0 ppm
Sn (tin)	ICPMS	1.0 ppm
W (tungsten)	NA	1.0 ppm
Cr (chromium)	DCP	2.0 ppm
Cd (cadmium)	DCP	1.0 ppm
Na (sodium)	DCP	100.0 ppm
K (potassium)	DCP	100.0 ppm
Mn (manganese)	DCP	2.0 ppm
Fe (iron)	DCP	2.0 ppm

FADCP - fire assay/double couple plasma
DCP - double couple plasma
ICPMS - inductively coupled plasma mass spectrometer
NA - instrumental neutron activation
wet - specific geochemical method

All analytical work performed by X-Ray Assay Laboratories of Don Mills, Ontario

Appendix 3. Lithogeochemical Data

APPENDIX 3

LITHOGEOCHEMICAL DATA

SAMPLE NO.	Au	Ag	As	Sb	Hg	Bi	Tl	Ba	Cu	Pb	Zn	Mo	Sn	W	Cr	Cd	Na	K	Mn	Fe
RB-1A	2	<0.5	36	40	280	0.2	8.1	525	4.5	10	32	6	2	<1	4	<1	6600	11000	190	42000
RB-1B	<1	1.0	350	30	780	0.2	9.3	111	22	10	38	11	3	<1	4	<1	35000	3300	210	54000
RB-2	3	<0.5	5	2.4	<5	0.4	1.0	215	10	10	23	3	4	<1	4	<1	20000	13000	300	23000
RB-3	5	2.0	13	7.5	77	0.3	50	422	16	20	82	5	10	3	<2	<1	1900	46000	230	21000
RB-4	1	<0.5	9	2.7	47	0.2	1.3	614	17	74	84	3	5	<1	<2	<1	19000	25000	36	16000
RB-5	2	0.5	31	2.4	78	0.2	3.0	919	4	18	15	7	9	2	4	<1	1500	71000	54	7200
RB-6A	1	<0.5	4	1.8	16	0.4	1.2	868	4	10	25	3	5	<1	2	<1	16000	31000	150	9400
RB-6B	<1	<0.5	15	2.0	6	0.5	1.0	736	5.5	12	13	3	6	<1	2	<1	18000	28000	94	7700
RB-7	<1	<0.5	6	2.1	<5	0.3	0.1	45	36	4	43	4	7	<1	4	<1	34000	1200	730	43000
RB-8	<1	<0.5	42	3.8	6	0.3	0.8	1450	94	10	36	4	3	<1	<2	<1	1200	50000	230	38000
RB-9	<1	<0.5	6	6.8	70	0.3	2.3	252	6	26	45	6	5	<1	2	<1	10000	25000	74	13000
RB-10	<1	<0.5	4	0.8	<5	0.2	0.3	255	24	20	89	4	3	<1	40	<1	35000	9000	840	66000
RB-11	<1	1.0	2	1.0	83	1.4	1.6	1400	84	2000	670	7	6	1	10	1	4400	52000	1100	22000
RB-12	<1	0.5	1	0.8	<5	0.3	3.6	989	38	58	54	8	3	3	6	<1	1400	67000	650	19000
RB-13	<1	0.5	4	0.7	<5	0.4	2.3	769	3	10	50	6	7	1	6	<1	3300	77000	530	23000
RB-14	8	3.0	110	2.6	140	2.9	1.2	942	270	84	1900	4	2	<1	120	4	23000	30000	1100	67000
RB-15	<1	1.5	12	0.7	<5	0.2	1.1	1830	30	56	87	4	2	1	64	<1	16000	34000	2000	52000
RB-16A	<1	<0.5	6	3.8	<5	0.3	0.8	585	37	46	340	8	4	3	6	1	27000	34000	490	15000
RB-16B	5	<0.5	20	3.3	87	1.8	3.5	830	95	3000	2500	7	4	6	20	16	3100	57000	1500	48000
RB-17A	<1	<0.5	39	3.1	10	0.3	2.8	1250	19	140	120	8	7	2	6	<1	1000	64000	110	14000
RB-17B	38	<0.5	100	9.2	100	2.1	5.0	959	16	260	260	7	12	12	42	<1	6500	32000	850	79000
RB-18	<1	<0.5	34	2.1	40	0.3	2.3	1710	100	2000	2700	4	2	2	94	5	1700	67000	3800	72000
RB-19A	120	<0.5	350	66	1000	0.2	12.8	155	310	2600	3600	7	2	6	<2	11	1800	66000	370	63000
RB-19B	84	<0.5	410	18	>1000	1.9	23.5	5340	11	36	37	7	3	5	6	<1	1500	83000	44	21000
RB-20	<1	0.5	1	0.7	5	0.7	0.5	77	4	<2	21	4	3	3	4	<1	53000	1400	190	7800
RB-21	<1	<0.5	<1	0.4	<5	<0.1	0.7	602	1.5	6	9.5	2	2	<1	6	<1	5400	19000	96	3200
RB-22	2	0.5	27	2.9	5	0.8	2.5	783	54	14	37	6	2	3	4	<1	1500	64000	550	29000
RB-23	10	<0.5	44	25	100	<0.1	2.5	649	21	180	110	7	5	4	8	<1	30000	32000	240	30000
RB-24A	170	32	810	310	>1000	0.3	57.2	1510	420	7400	5100	15	4	14	6	7	2300	72000	190	34000
RB-24B	140	6	1400	45	>1000	<0.1	85.1	1030	85	510	1100	12	2	40	8	3	2300	47000	110	49000
RB-24C	21	1.5	260	45	380	<0.1	9.2	154	44	600	780	2	<1	5	48	4	600	12000	130	17000
RB-25	1	<0.5	14	1.1	13	0.1	0.3	748	17	10	87	3	1	<1	130	<1	18000	6200	1200	56000
RB-26	<1	<0.5	<1	3.6	10	0.3	0.8	223	6.5	44	29	3	3	<1	48	<1	800	14000	44	31000
RB-27	<1	<0.5	90	7.0	17	0.1	0.2	84	40	10	120	3	<1	<1	110	<1	9900	2200	1200	54000
RB-28	<1	<0.5	<1	77.0	<5	0.2	0.7	346	7	44	70	3	2	<1	92	<1	900	17000	72	25000
RB-29	<1	<0.5	4	1.1	6	0.3	0.8	901	6.5	20	32	4	3	<1	110	<1	36000	25000	270	22000
RB-30	<1	<0.5	17	2.9	6	1.2	1.6	478	6.5	18	48	3	5	3	4	<1	1200	43000	140	14000
RB-31	<1	<0.5	8	6.1	<5	0.3	1.4	41	4.0	14	150	2	9	1	<2	<1	600	26000	140	18000
RB-32	3	<0.5	2	0.9	<5	<0.1	<0.1	23	4.5	10	56	7	2	<1	150	<1	2800	900	710	63000

APPENDIX 3 CONTINUED
LITHOGEOCHEMICAL DATA

SAMPLE NO.	Au	Ag	As	Sb	Hg	Bi	Tl	Ba	Cu	Pb	Zn	Mo	Sn	W	Cr	Cd	Na	K	Mn	Fe
RB-33A	<1	<0.5	31	0.8	17	0.4	1.7	1050	8	20	23	4	3	3	4	<1	3400	46000	62	16000
RB-33B	<1	<0.5	22	1.1	17	0.2	1.4	938	6	28	21	3	4	4	8	<1	1100	40000	56	8000
RB-34	<1	<0.5	12	3.4	<5	0.4	1.8	576	5	20	65	7	6	2	2	<1	1800	47000	210	28000
RB-35	<1	<0.5	3	2.2	<5	<0.1	0.3	362	6	<2	21	5	3	2	6	<1	41000	9600	170	14000
RB-36	7	<0.5	7	0.2	23	0.3	0.8	567	2.5	10	58	5	7	<1	4	<1	7700	39000	260	18000
RB-37	5	<0.5	3	<0.2	5	<0.1	<0.1	198	47	<2	150	8	1	<1	230	1	28000	4000	1300	98000
RB-38	<1	1.0	10	0.4	69	0.1	0.6	142	12	6	46	3	1	<1	62	<1	19000	6300	900	28000
RB-39	<1	<0.5	24	1.6	<5	<0.1	0.4	1030	54	20	140	3	1	5	250	<1	28000	6900	1300	91000
RB-40	38	<0.5	170	4.2	120	0.1	3.8	234	180	680	670	4	1	2	150	2	2800	34000	850	65000
RB-41A	<1	2.5	92	11.0	270	0.1	3.9	289	64	770	400	4	1	4	200	<1	2400	57000	610	60000
RB-41B	1	5.5	440	23.0	260	<0.1	3.0	193	39	180	240	12	<1	2	140	<1	2100	41000	360	52000
RB-42	<1	<0.5	15	5.0	5	<0.1	0.2	130	7	10	31	5	1	1	86	<1	800	8700	52	34000
RB-43A	<1	<0.5	42	0.9	5	<0.1	<0.1	672	46	<2	120	8	1	<1	190	<1	35000	6200	1500	91000
RB-43B	10	<0.5	40	18	24	<0.1	0.2	822	40	<2	95	5	1	1	110	<1	16000	7400	950	63000
RB-44	5	<0.5	30	1.1	5	<0.1	0.2	49	25	10	44	4	<1	<1	100	<1	900	8300	78	70000
RB-45	<1	<0.5	12	2.0	44	0.1	0.7	310	30	12	120	6	2	1	120	<1	7500	20000	880	56000
RB-46	<1	<0.5	39	8.2	15	<0.1	0.4	247	16	26	68	2	1	<1	76	1	15000	10000	490	29000
RB-47A	7	<0.5	59	28	8	<0.1	0.3	102	13	32	46	3	2	1	120	<1	700	7100	64	42000
RB-47B	4	<0.5	300	61	13	<0.1	<0.1	48	12	50	62	6	1	3	190	<1	1200	1200	92	73000
RB-48	<1	<0.5	78	30	13	<0.1	0.3	134	11	48	68	3	1	<1	70	<1	500	8700	250	33000
RB-49A	<1	<0.5	27	7	23	<0.1	1.0	275	35	20	310	3	1	4	250	2	5400	33000	2200	120000
RB-49B	8	<0.5	35	4.5	17	<0.1	0.4	151	13	16	19	2	2	3	80	1	23000	14000	120	7800
RB-50A	<1	<0.5	28	24	8	<0.1	0.4	179	8	18	64	2	1	1	82	<1	600	13000	110	26000
RB-50B	<1	<0.5	33	21	21	<0.1	<0.1	42	16	20	35	4	1	<1	130	2	800	2700	200	14000
RB-51A	<1	<0.5	85	34	5	<0.1	<0.1	32	13	38	42	10	2	1	220	<1	1100	2600	90	78000
RB-51B	<1	<0.5	26	7.3	7	<0.1	<0.1	64	11	18	30	4	<1	<1	92	1	600	4800	150	4700
RB-52	1	<0.5	420	14	360	0.2	1.1	502	17	24	50	3	1	1	80	<1	800	13000	66	24000
RB-53A	8	<0.5	1600	63	350	0.3	16.0	653	19	130	380	16	4	<4	20	1	8800	39000	230	50000
RB-53B	40	<0.5	2300	61	380	0.4	37.3	499	63	370	300	14	5	<4	54	1	7300	28000	330	96000
RB-54	<1	<0.5	12	1.1	<5	0.3	0.9	1210	130	16	98	2	6	4	<2	<1	6700	31000	430	37000
RB-55	<1	<0.5	14	1	7	0.4	1.2	887	5	10	17	7	4	<1	6	<1	22000	47000	110	14000
RB-56	43	<0.5	380	15	350	0.2	7.1	1180	120	590	190	11	3	2	38	2	2200	59000	58	29000
RB-57	13	2.0	74	5.6	69	0.2	2.5	486	19	130	160	6	3	2	12	<1	900	56000	110	13000
RB-58	2	<0.5	30	1.7	21	0.6	1.8	716	3.5	14	19	3	4	3	4	<1	1900	60000	250	16000
RB-59	2	1.0	27	2.0	260	0.7	1.5	592	42	210	44	10	5	5	6	<1	2500	56000	120	6900
RB-60	6	<0.5	25	1.7	100	6.8	1.2	709	34	180	200	18	5	1	8	2	8000	57000	140	14000
RB-61	<1	<0.5	25	1.2	13	0.2	1.7	616	4.5	12	21	2	5	<1	4	<1	3800	55000	130	12000
RB-62	<1	1.0	44	4.2	10	0.6	4.0	544	6	86	38	5	6	1	4	<1	1200	64000	84	8800
RB-63	3	1.0	83	7.2	110	0.3	3.2	367	10	230	52	11	3	1	4	<1	1200	60000	110	9600

All elements in ppm except Au and Hg (ppb)
A negative sign (-) indicates "less than"

NEW BRUNSWICK
DEPARTMENT OF NATURAL RESOURCES AND ENERGY
MINERALS AND ENERGY DIVISION

NOUVEAU-BRUNSWICK
MINISTÈRE DES RESSOURCES NATURELLES ET DE L'ÉNERGIE
DIVISION DES MINÉRAUX ET DE L'ÉNERGIE

21-O/3 E

PLATE 88-43

PRE
LITHO

67°15' 10' 05' 67°00'
47°15' 47°15'

Ds
RB-38
RB-39
RB-45
RB-44
RB-43A,B
RB-42
RB-51A,B
RB-47A,B
RB-49A,B
RB-41A,B
RB-40
RB-50A,B
RB-46
RB-52
RB-53A,B
RB-59
RB-61
RB-58
RB-60
RB-56
RB-55
RB-57
Dm
Dmv2
Dfv4
Dfv2
Dfv1
Dfv5
Falls Mountain
Bald Peak
Riley Brook
SERPENTINE MOUNTAINS
RIGHT HAND BRANCH
TOBIQUE RIVER
MAIN RIVER RIDGE
Nictau
Bear Brook
Blackguard
Reed and Hutchinson Ponds
Lizard Pond
Bear Pond
Little Bear Pond
Baldwin Park
Blaine Dingee
10'

MISSISSIPPIAN

Arthurette Red

Mar — Red sands

DEVONIAN

Gabbroic

Dm — Gabbro; d

LOWER DEVONIAN

Tobique Group

Irterbedd
and sedim
order not

Ds — Dark grey
thinly b
siltston
medium-g
cross-la
grey to
polymict
or mafic

Dfv7 — Brick-re
flow-band
rhyolite
green or
rhyolite
rocks

Dfv6 — Grey-bro
intermed
feldspar

Dfv5 — Red-brow
rhyolite
rhyolite

Dfv4 — Pink-ora
porphyri

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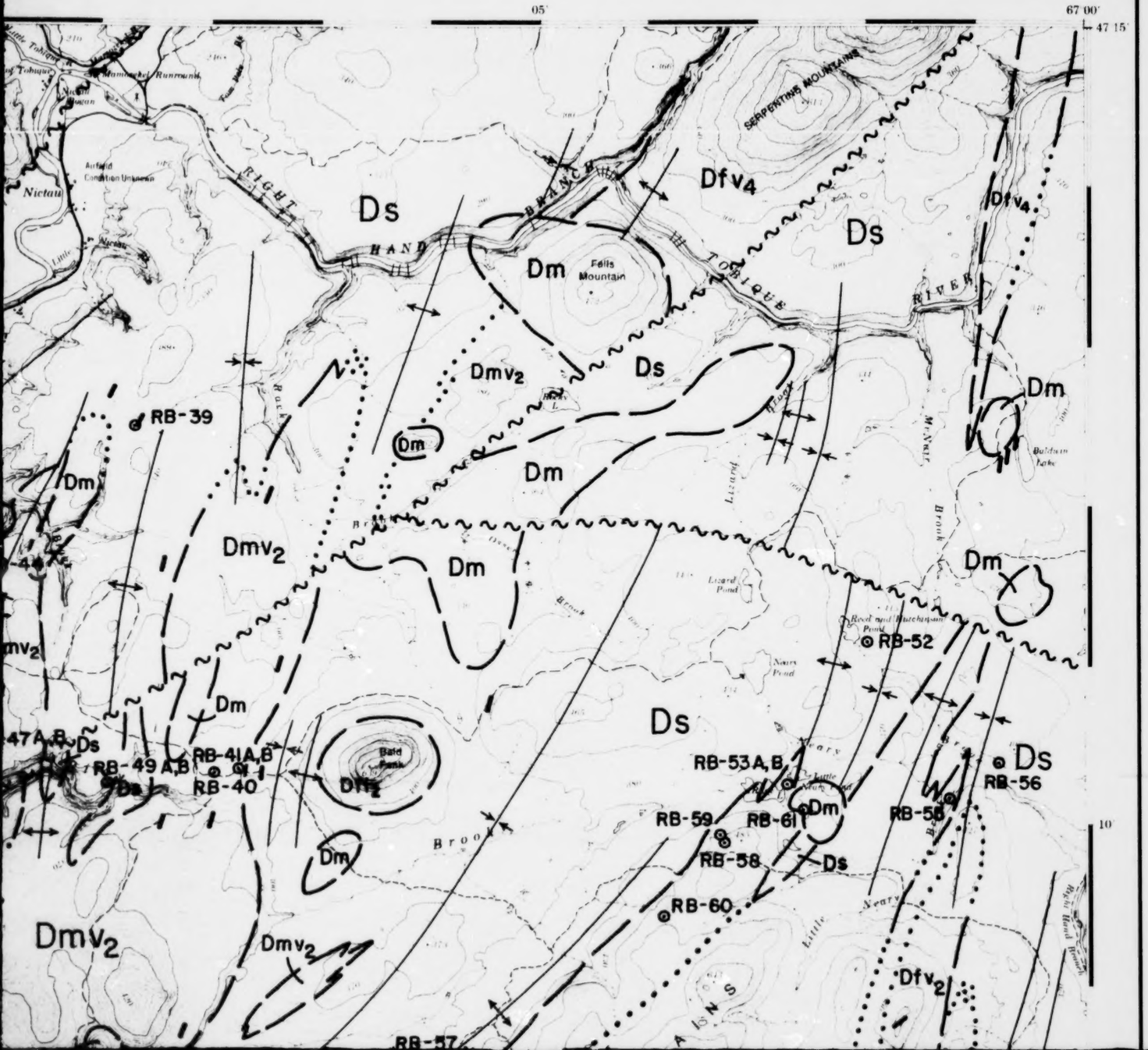
DIVISION DES MINÉRAUX ET DE L'ÉNERGIE

PLATE 88-43



PRELIMINARY GEOLOGICAL MAP AND LITHOGEOCHEMICAL SAMPLE LOCATIONS RILEY BROOK (EAST)

LEGEND

MISSISSIPPIAN

Arthurette Redbeds

Mar — Red sandstone, conglomerate, mudstone

DEVONIAN

/ — Gabbroic or diabasic dykes

Dm — Gabbro; diorite

LOWER DEVONIAN

Tobique Group

Irterbedded felsic and mafic volcanic and sedimentary rocks (stratigraphic order not defined):

Ds — Dark grey to dark green, massive to thinly bedded or parallel-laminated siltstone; grey to green, fine- to medium-grained massive to parallel- or cross-laminated quartzose sandstone; grey to green slate; rare shale and polymictic conglomerate; local felsic or mafic volcanic rocks

Dfv_7 — Brick-red to brown or maroon, massive, flow-banded or sparsely porphyritic rhyolite; red-brown to maroon, locally green or pink rhyolite tuff; minor rhyolite breccia and mafic volcanic rocks

Dfv_6 — Grey-brown to grey-green felsic to intermediate pyroclastic rocks; minor feldspar porphyry

Dfv_5 — Red-brown to grey-brown flow-banded rhyolite and sparsely porphyritic rhyolite

Dfv_4 — Pink-orange rhyolite tuff and porphyritic rhyolite

Felsic intrusive (subvolcanic) equivalents to Dfv

Dfi_3 — Reddish-orange, medium- to coarse-grained K-spar/amphibole syenite

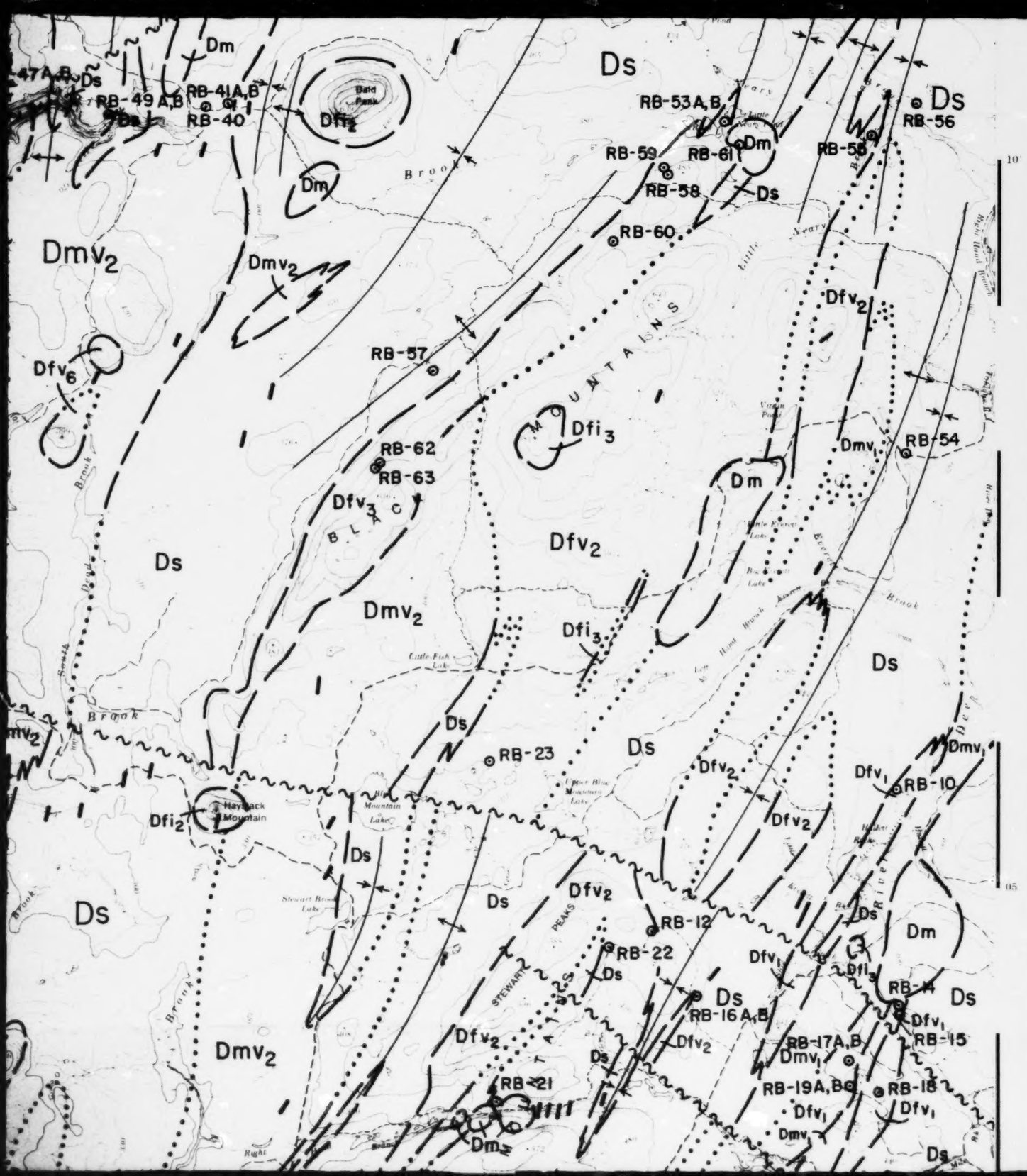
Dfi_2 — Grey-brown to grey-green dacitic feldspar porphyry

Dfi_1 — Orange-brown rhyolitic feldspar porphyry

RB-42 RB-51A,B RB-47A,B RB-49A,B RB-41A,B RB-40 RB-48 RB-50A,B RB-46 RB-53A,B RB-59 RB-61 RB-58 RB-60 RB-56 RB-55 RB-57 RB-62 RB-63 RB-54 RB-28 RB-27 RB-25 RB-26 RB-30 RB-31 RB-23 RB-22 RB-12 RB-16A,B RB-17A,B RB-19A,B RB-21 RB-14 RB-15 RB-18 RB-10

Ds Dm Dmv_2 Dmv_1 Dfv_7 Dfv_6 Dfv_5 Dfv_4 Dfv_3 Dfv_2 Dfv_1 Dfi_2 Dfi_3 Dfi_1 Mar

Riley Brook · Bald Peak · Brook · Mary · Little · Mary Pond · Hurd Brook · Hurd Pond · Brook · Brook · Brook



Dfv$_7$ Brick-red to brown or maroon, massive, flow-banded or sparsely porphyritic rhyolite; red-brown to maroon, locally green or pink rhyolite tuff; minor rhyolite breccia and mafic volcanic rocks

Dfv$_6$ Grey-brown to grey-green felsic to intermediate pyroclastic rocks; minor feldspar porphyry

Dfv$_5$ Red-brown to grey-brown flow-banded rhyolite and sparsely porphyritic rhyolite

Dfv$_4$ Pink-orange rhyolite tuff and porphyritic rhyolite

Dfv$_3$ Grey to green, locally pink-buff or grey-brown rhyolite tuff and massive aphanitic rhyolite

Dfv$_2$ Light to dark grey, grey-green, grey-brown, or pink to greyish pink massive aphanitic to sparsely porphyritic rhyolite; minor felsic tuff, breccia, and flow-banded rhyolite; local interbedded mafic volcanic rocks

Dfv$_1$ Grey to green, pink, or greyish pink massive and flow-banded rhyolite; minor porphyritic rhyolite and rhyolite tuff

Dmv$_2$ Dark grey, olive-green or dark green mafic volcanic rocks; massive to vesicular or amygdaloidal basaltic and andesitic flows and minor tuffs; pillow basalt; local interbedded dark grey to green siltstone

Dmv$_1$ Dark grey to dark green mafic tuff, minor mafic flows

Dfi$_3$ Orange-brown rhyolitic feldspar porphyry

Dfi$_2$ feldspar porphyry

Dfi$_1$ Orange-brown rhyolitic feldspar porphyry

KEY

Geological contact (approximate, assumed)

Fault

Synclinal, anticlinal axes

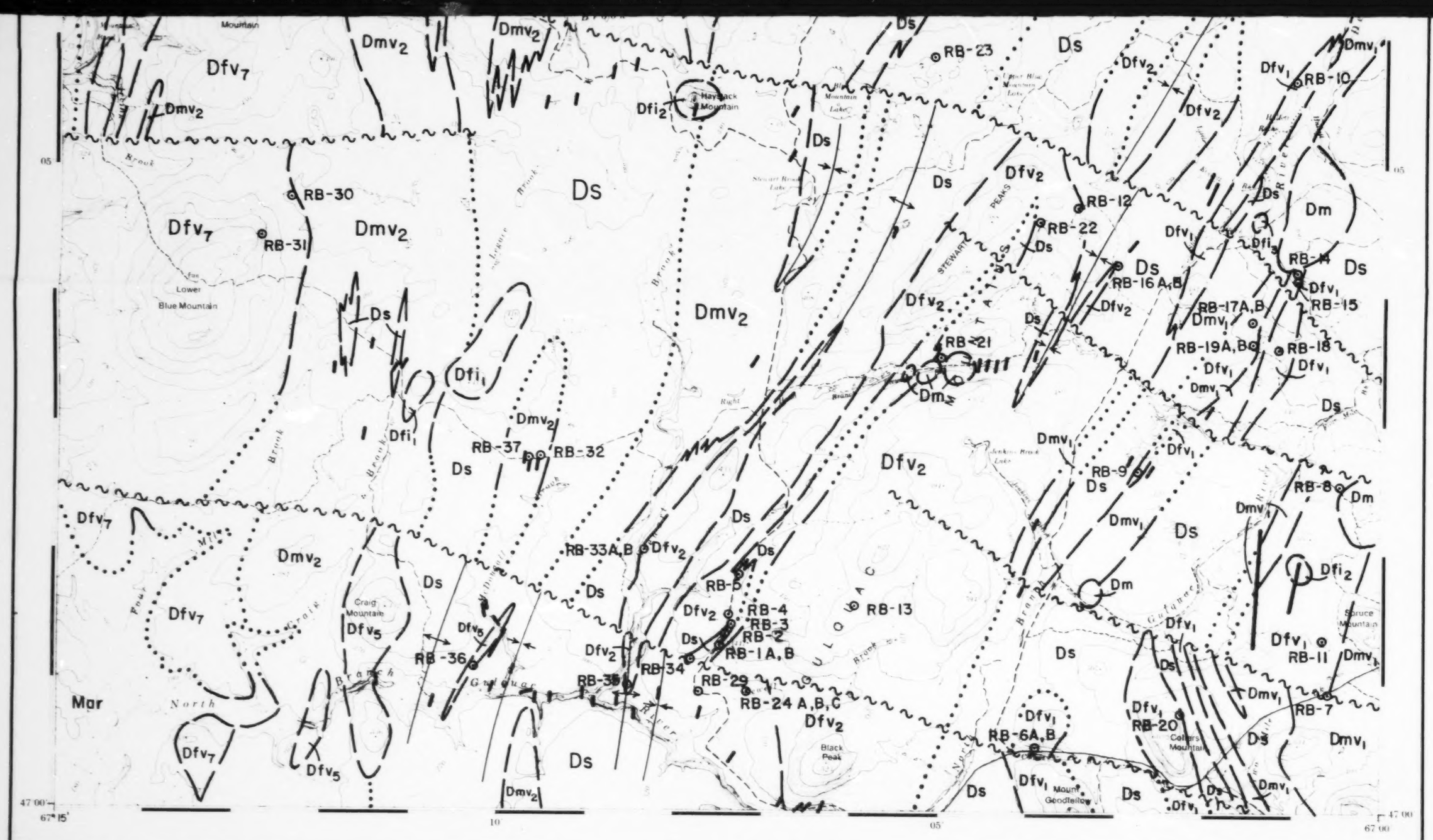
⊙RB-10 Location and number of sample collected for lithogeochemical analysis

Geology by: R.A. Wilson, based on mapping by R.A. Wilson and R. Sullivan (1988)

Other Sources: N.B. Minerals & Energy Division, Map Plates 77-9, 10, 11 (R.R. Irrinki 1975)
N.B. Mineral Assessment Files

Base map produced by the Surveys and Mapping Branch, Department of Energy, Mines and Resources. North American Datum 1927

Drafted by T. Leonard 1988.



Dmv1 minor ma

Geologic

Fault

Synclina

RB-10 Location

Geology by: R.A.

Other Sources: N

Base map produce
Resources. North

Drafted by T. Leo

Miles

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Cette carte de base été produite en vertu de l'entente Canada-Nouveau-Brunswick sur l'exploitation minerale, une entente auxiliaire de l'entente cadre sur le développement économique et régional.

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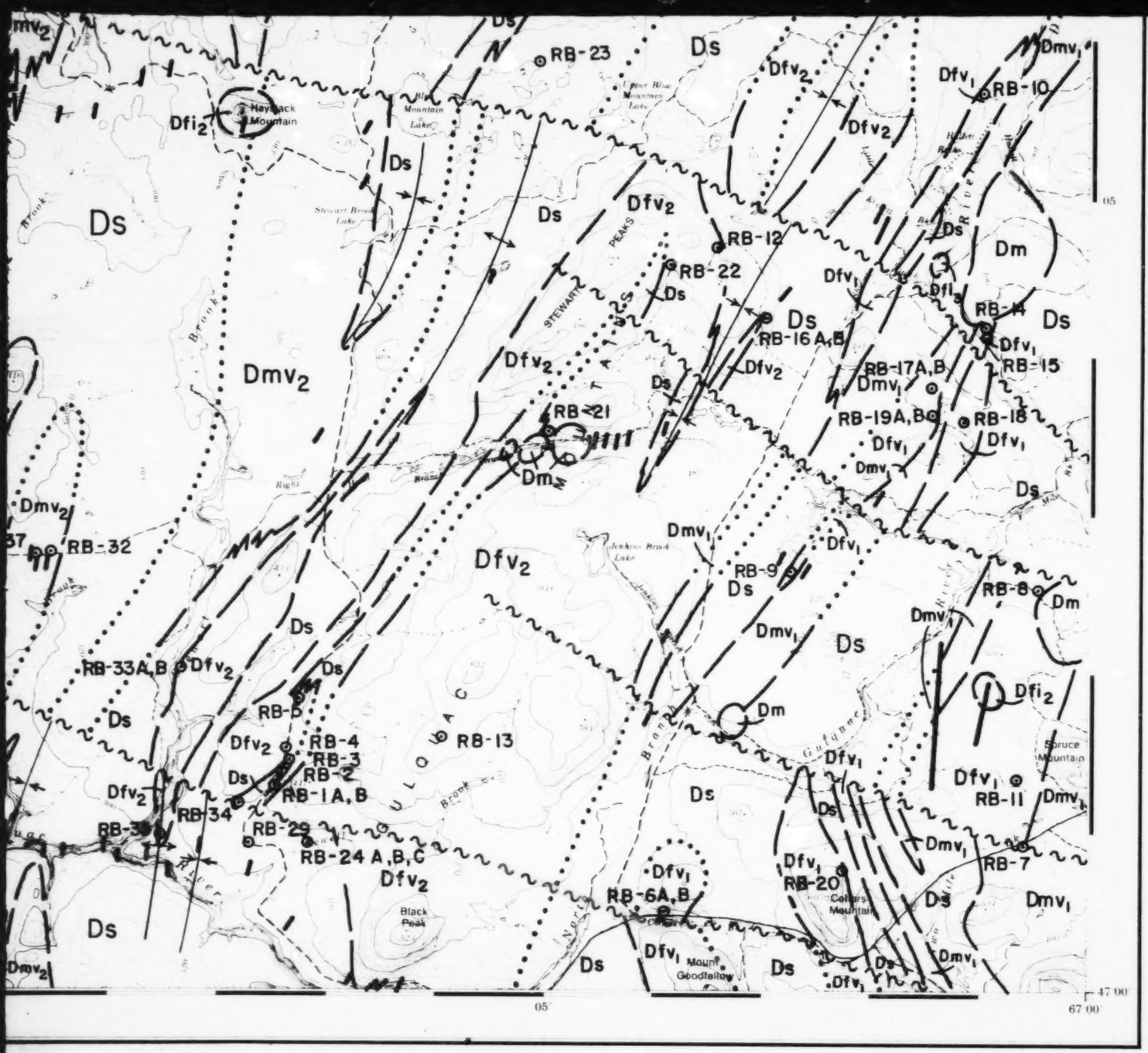

Dmv1 Minor mafic flows

KEY

Geological contact (approximate, assumed)

Fault

Synclinal, anticlinal axes

⊙RB-10 Location and number of sample collected for lithogeochemical analysis

Geology by: R.A. Wilson, based on mapping by R.A. Wilson and R. Sullivan (1988)

Other Sources: N.B. Minerals & Energy Division, Map Plates 77-9, 10, 11 (R.R. Irrinki 1975)
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Base map produced by the Surveys and Mapping Branch, Department of Energy, Mines and Resources. North American Datum 1927

Drafted by T. Leonard 1988.

Scale 1:50,000 Échelle

Miles 1 0 1 2 3 Miles

Metres 1000 0 1000 2000 3000 4000 Mètres

Canada New Brunswick Mineral Development Agreement
Entente Canada Nouveau-Brunswick L'Exploitation Minérale

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Cette carte de base dété produité en vertu de l'entente Canada-Nouveau-Brunswick sur l'exploitation minerale une entente auxiliaire de l'entente cadre sur le développement économique et régional

nd Energy Ressources naturelles et Énergie Nouveau-Brunswick
Energy, Mines and Resources Canada Énergie, Mines et Ressources Canada